DOCUMENT RESUME

ED 388 615 SO 025 780

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TITLE Math and Music: Harmonious Connections.
REPORT NO ISBN-0-86651-829-0
PUB DATE 95
NOTE 162p.
AVAILABLE FROM Dale Seymour Publications, P.O. Box 10888, Palo Alto, CA 94303-1879 ($11.95; order number DS21335).
PUB TYPE Books (010) -- Guides - Classroom Use - Instructional Materials (For Learner) (051) -- Guides - Classroom Use - Teaching Guides (For Teacher) (052)

EDRS PRICE Document Not Available from EDRS.
DESCRIPTORS Algebra; *Harmony (Music); Intermediate Grades; *Mathematical Concepts; *Music; Patternmaking; *Ratios (Mathematics); Secondary Education; Symmetry; *Transformations (Mathematics)
IDENTIFIERS Fractals; *Golden Ratio (Mathematics)

ABSTRACT

Mathematics can be used to analyze musical rhythms, to study the sound waves that produce musical notes, to explain why instruments are tuned, and to compose music. This book explores the relationship between mathematics and music through proportions, patterns, Fibonacci numbers or the Golden Ratio, geometric transformations, trigonometric functions, fractals, and other mathematical concepts. The book is organized into eight chapters: (1) "The Essence: Introduction"; (2) "The Beat: Rhythm"; (3) "The Tone: Frequency, Amplitude"; (4) "The Tune: Tuning"; (5) "The Song: Composition"; (6) "The Source: Instruments"; (7) "The People: Human Connections"; and (8) "The Curiosities: An Assortment." An epilogue, end notes, bibliography, and index conclude the book. (MM)

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